



Interim report

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Screening for Dyslexia / Specific Learning Difficulties

Executive summary

- The *No To Failure* project is an empirical study to (a) demonstrate the educational importance and efficacy of screening for dyslexia/specific learning difficulties (dyslexia/SpLD), (b) understand how dyslexia/SpLD, if ignored, can lead to educational failure, and (c) evaluate the impact of specialist teaching on the literacy skills and educational development of pupils found to be at risk of dyslexia/SpLD.
- In the screening phase of the study a total of 1,341 pupils were screened in Years 3 and 7 in 20 schools across three different local authorities in England. This sample is reasonably representative of schools nationally, although slightly biased towards the lower end of the socio-economic spectrum.
- Screening was carried out using standardised tests of reading, spelling, phonological decoding, phonological processing and verbal memory. Children whose standard scores on these measures were at or below 85, or who were at or below standard score 85 in reading and/or spelling and who displayed other evidence of SpLD (such as problems of coordination, attention or visual-perceptual skills), were classed as being at risk of dyslexia/SpLD.
- It is acknowledged that there are several theoretical models of dyslexia, although the greatest weight of evidence supports the phonological deficit model. Two-thirds of the children in the at-risk group were found to have phonological difficulties.
- Overall, 55% of all pupils who did not achieve expected levels in national Standard Assessment Tests (SATs) were found to be at risk of dyslexia/SpLD, indicating that unidentified dyslexia/SpLD is a major cause of educational failure that could be remedied but which at present is largely ignored.
- Overall, 21% of pupils screened using a variety of psychometric tests were found to be at risk of dyslexia/SpLD, a category that will include a broad range of pupils with learning difficulties which are biological in origin and who would be expected to benefit from specialist tuition. This figure is in line with international estimates.
- The proportion of pupils found to be at risk of dyslexia/SpLD was relatively higher for Year 3 (26%) and somewhat lower for Year 7 (18%), indicating that a third of children who are at risk of educational failure have been lifted

out of risk between Years 3 and 7 as a result of their schools' approaches to teaching, learning and whatever SEN provision has been made. However, two thirds of the children remain at risk, underlining the need for increased expertise amongst those working in the schools to identify and address SEN.

- The results suggest that in areas of socio-economic deprivation a relatively greater proportion of pupils who did not achieve expected levels for SATs did so for reasons other than dyslexia/SpLD, while in less deprived areas a relatively greater proportion of pupils who did not achieve expected levels in SATs did so because of dyslexia/SpLD. This is consistent with research evidence on the genetic basis of dyslexia/SpLD, and that dyslexia/SpLD conditions are largely independent of intelligence and socio-economic factors.
- A relatively greater proportion of at-risk children in Year 7 have more severe difficulties, compared with their counterparts in Year 3. This finding, which is based on the number of cognitive deficits shown by the pupils, demonstrates the importance of identifying at-risk children as early as possible so that appropriate intervention can be put in place sooner rather than later.
- The results of the screening phase of the *No To Failure* project highlight the considerable scale of the dyslexia/SpLD problem in schools, the role that dyslexia/SpLD plays in children who do not achieve target levels in SATs, and the apparent inadequacy of existing educational strategies to lift children out of risk. Fortunately there is a deliverable solution to these problems, for there is firm international research evidence that such pupils respond well to specialist teaching and can progress to competent literacy (Torgeson, 2005).

Introduction

The *No To Failure* project is an empirical study to demonstrate the educational importance and efficacy of screening for dyslexia/specific learning difficulties and the impact of specialist teaching on the literacy skills and educational development of pupils found to be at risk of dyslexia/SpLD. The underlying principle behind the study is that children at risk of dyslexia/SpLD should be identified and supported by appropriately trained staff as early as possible, in line with the SEN Code of Practice. Consistent with these aims, the project has two key strands:

- 1) **Communication:** Highlighting the link between children failing in school and dyslexia/SpLD, showing why dyslexia/SpLD training is critical and essential for teachers, thus encouraging schools to spend their budgets on effective training and support.
- 2) **Demonstration:** Showing how to get it right by setting up training and support systems in a group of trailblazer schools representing a geographic and socio-economic spread. Promoting and publicising examples of existing good practice in dyslexia/SpLD management.

The *No To Failure* project is supported by the Department for Children, Schools and Families (DCSF), led by Xtraordinary People, and involves the participation of the three leading national organisations for dyslexia, namely the British Dyslexia Association, Dyslexia Action, and PATOSS (Professional Association of Teachers of Students with Specific Learning Difficulties).

This Interim Report has been prepared by the Independent Evaluator of the *No To Failure* project, Dr Chris Singleton, Chartered Psychologist and Senior Lecturer

in Educational Psychology at the University of Hull. The aim is to outline the screening that has been carried out, present the results of that screening, and briefly consider some of the major implications.

Dyslexia and Specific Learning Difficulties

Specific learning difficulties is an umbrella term covering a range of developmental learning problems that are biological in origin, have a high heritability, are largely independent of intelligence and socio-economic factors, and show individual differences in severity. The most common form of SpLD is dyslexia, usually characterised by cognitive deficits in phonological processing and verbal memory (Snowling, 2000; Vellutino et al, 2004), although other cognitive impairments may also sometimes be found. The principal impact of dyslexia is on literacy development, but other aspects of learning, including mathematic and foreign languages, are often affected. Other forms of SpLD are developmental coordination disorder (DCD, often also known as dyspraxia), attentional disorders, such as attention deficit hyperactivity disorder (ADHD), and dyscalculia (also known as specific arithmetic disorder). These developmental conditions show such a high degree of comorbidity (overlap) that it can be educationally unhelpful to try to be precise about labels. Although most children with dyslexia/SpLD typically struggle with the acquisition of literacy skills and are consequently at high risk of educational failure, there is firm international research evidence that they respond well to specialist teaching that uses systematic multisensory methods to teach synthetic phonics, word recognition and spelling (Torgeson, 2005). This approach establishes a firm base from which they can progress to competent literacy and can overcome the barriers to educational achievement created by their difficulties.

Participants

Three different local authorities participated in the project. These authorities were chosen to give a wide geographic and socio-economic spread. Within each authority, schools were selected from both primary and secondary sectors. A total of 20 schools participated, and a total of 1,341 pupils were screened in Years 3 and 7 in these schools (see Table 1).

Table 1. Local Authorities and schools participating in the project

Local Authority	Description	Primary schools		Secondary schools	
		N	Pupils screened	N	Pupils screened
A	A large London inner city borough with a wide ethnic mix.	3	125	2	312
B	A rural community in the south west of England with some very small village schools.	9	161	1	118
C	An authority in the north of England that includes towns and a widespread rural community.	3	131	2	494

Screening

In each of the participating schools screening was carried out to identify the pupils at risk of dyslexia/SpLD. This screening was targeted at Year 3 and Year 7 – these school years being chosen for various pragmatic reasons, as well as the desire to include SATs results from Years 1 and 6 in the data analysis. Screening was carried out in three successive phases, as follows:

1. **Group screening** – for the whole year group in each school.
2. **Individual screening** – for those pupils with spelling or reading scores one standard deviation (or greater) below the mean (this is equivalent to a standard score of 85 or less).
3. **Identification of pupils at risk of dyslexia/SpLD.**

The screening assessed reading, writing and spelling skills as well as cognitive skills such as phonological awareness and verbal memory, which crucially underpin literacy development (Bowey, 2005). Well-established psychometric tests were employed. Details of the tests used in the screening are shown in Table 2.

Table 2. Psychometric tests used in the project

	Primary Y3	Secondary Y7
Group screening	<ul style="list-style-type: none"> • Vernon Graded Word Spelling Test • Suffolk Reading Test • Free writing 	<ul style="list-style-type: none"> • Vernon Graded Word Spelling Test • Suffolk Reading Test • Free writing
Individual screening	<ul style="list-style-type: none"> • TOWRE (Test of Word Reading Efficiency) [Phonic decoding] • Turner & Ridsdale Digit Span Test [Verbal memory] • Phonological Assessment Battery (PhAB): Fluency Tests – Alliteration & Rhyme & Semantic • Non-verbal and verbal reasoning from Lucid Ability 7-12 	<ul style="list-style-type: none"> • TOWRE (Test of Word Reading Efficiency) [Phonic decoding] • Turner & Ridsdale Digit Span Test [Verbal memory] • Phonological Assessment Battery (PhAB): Spoonerisms • Non-verbal and verbal reasoning from Lucid Ability 11-16

It should be noted that this is a generalised screening to identify pupils at risk of dyslexia/SpLD, and not a definitive diagnostic assessment for dyslexia. It should also be noted that this approach to identification of at-risk pupils was adopted for pragmatic reasons connected with time and resources available to the project and is not being put forward as the only, or necessarily the best, way to identify such pupils. There are many available tests that can be used for screening and assessment in circumstances such as these, and different ways in which the data from such tests can be used. As far as this project is concerned, however, the critical factor is the professional training of specialist teachers, enabling them to select and apply the most suitable tests based on evidence, and in interpreting and acting appropriately on the test results.

Identification of pupils at risk of dyslexia

The data from the individual screening was used to identify 'at risk' pupils, defined as those having a dyslexia/SpLD profile, i.e. significant impairments in reading and/or spelling (standard scores 85 or lower) together with either (a) a clear pattern of cognitive deficits in phonology and/or verbal memory, or (b) other indicators of SpLD, such as persistent problems of coordination, attention or visual-perceptual skills that are reflected in classroom activities such as writing, mathematics, following instructions, learning and recall. This identification was carried out by specialist teachers in consultation with school staff. The pupil's verbal and nonverbal ability was factored into this identification process although it should be noted that a conventional 'discrepancy approach' to identification of at-risk pupils was not explicitly applied.

Each of the at-risk pupils was allocated to one of two groups: the intervention group, which received 20 hours of specialist tuition, and the control group, which did not receive specialist tuition during the project but which will receive specialist tuition at the end of the project. This delayed intervention approach for the control group was adopted to ensure that the educational needs of the at-risk pupils assigned to the control group were addressed in an ethical manner that did not compromise the scientific integrity of the project design, which followed a pre-test – intervention – post-test paradigm. The results of the intervention will be reported in the final report of the *No To Failure* project, which is scheduled for publication early in 2009.

It should be noted that the design of this project does not take into account pupils with dyslexia/SpLD whose reading and spelling is not below one standard deviation below the mean, but who nevertheless are not achieving up to their potential. Such pupils will often be bright, and/or come from home backgrounds that are educationally high achieving, and may already have received some appropriate intervention for their difficulties. Although specialist teachers are perfectly capable of identifying such pupils, to have attempted to include them in this study would have required an alternative screening approach that would not have been practical within the financial and time constraints of the project.

Results

The results of the screening are shown in Table 3. This table shows the total numbers of pupils screened in each type of school in each authority, the proportion of those who did not achieve expected levels in national Standard Assessment Tests (SATs) given at the end of year 2 and year 6, and the proportion of those screened who were found to be at risk of dyslexia/SpLD. Note that 177 pupils for whom a full data set was not available have been omitted from the analyses.

Overall, 69% of all the pupils scoring 85 or below on the tests of reading and/or spelling were found to be at risk of dyslexia/SpLD. This figure differed only very slightly with age: 67% for Year 3, and 72% for Year 7. The at-risk group comprised 21% of the total sample, a figure that was remarkably similar across the three local authorities, confirming not only that consistent criteria have been applied, but also that these criteria relate to the identification of learning difficulties that are largely independent of socio-economic factors. This finding is also consistent with internationally published figures, which estimate the overall prevalence of impairments of a dyslexic nature at about 15-20% of the general population (International Dyslexia Association, 2007; see also Shaywitz, 1992).

25% of pupils screened did not achieve expected levels in SATs (i.e. at Key Stage 1, level 2C or below in reading and writing; at Key Stage 2, level 3 or below in English overall score). This proportion was relatively higher in the local authority A than it was in the other two local authorities, a finding consistent with national evidence indicating that SATs results are partly a function of socio-economic deprivation (see Ginsborg and Locke, 2002). In all the participating schools in local authority A the percentage of children receiving free school meals was either above (or well above) the national average, indicating relatively high levels of deprivation. By contrast, all except one of the participating schools in local authority B were below the national average for deprivation, the exception being at the national average level. In local authority C a few of the participating schools were below the national average for deprivation but most were roughly in line with national averages.

Table 3. Analysis of screening results

LEA	Category	Total screened	Proportion that did not achieve expected levels in SATs		Proportion of screened that are at risk of dyslexia/SpLD		Proportion that did not achieve expected levels in SATs and also at risk of dyslexia/SpLD	
		N	N	%	N	%	N	%
A	Primary	125	66	52.8	33	26.4	33	50.0
	Secondary	135	24	17.8	18	13.3	7	29.2
	Both	260	90	34.6	51	19.6	40	44.4
B	Primary	161	57	35.4	38	23.6	29	50.9
	Secondary	118	23	19.5	20	16.9	11	47.8
	Both	279	80	28.7	58	20.8	40	50.0
C	Primary	131	54	41.2	36	27.5	36	66.7
	Secondary	494	68	13.8	98	19.8	47	69.1
	Both	625	122	19.5	134	21.4	83	68.0
All	Primary	417	177	42.4	107	25.7	98	55.4
	Secondary	747	115	15.4	136	18.2	65	56.5
	Both	1164	292	25.1	243	20.9	163	55.8

The proportion of pupils who did not achieve expected levels in SATs was higher for Year 3 (42%) and lower for Year 7 (15%). Current national SATs results show that, at Key Stage 1, 34% of pupils did not achieve Level 2B or above in reading (DCSF, 2007a) and, at Key Stage 2, 25% of pupils did not achieve Level 4 or above in English (DCSF, 2007b). This indicates that in comparison with national figures, the Year 3 sample are performing rather worse than expected and the Year 7 sample rather better.

Analysis of cognitive deficits in the at risk group

Data from the individual screening enabled an analysis of the number and type of deficits shown by the pupils in the at-risk group. The results of this analysis are given in Table 4. In this analysis, 'cognitive deficit' means obtaining a standard score of 85 or less on the appropriate test shown in Table 2. These results show that 58% of children found to be at risk have a working memory (WM) deficit, 39% have poor phonic decoding (PD) skills, and 28% have phonological processing (PP) deficits. Working memory is the cognitive process that enables us to hold a limited amount of information in a short-term temporary store while carrying out other tasks, such as speaking, listening, reading, writing or doing mathematics. Phonic decoding is a learned skill that involves systematically relating graphemes (letters) to phonemes (language sounds), enabling us to read words that we cannot recognise by sight alone. Phonological processing refers to a range of cognitive skills associated with manipulating the sounds of language, including awareness of rhyming and alliteration, and transposition of letters and syllables in words (spoonerisms). Deficits in these cognitive abilities are the hallmarks of dyslexia (Snowling, 2000) and hence children exhibiting these problems can be regarded as probably having dyslexia.

Table 4. Percentages of the at-risk group showing cognitive deficits

Category	PD deficit	PP deficit	WM deficit	No deficit	1 deficit	2 deficits	3 deficits	PP and/or WM deficit	No PP or WM deficit
Primary	22.4	33.6	50.5	29.0	41.1	24.3	5.6	65.4	5.6
Secondary	51.5	22.8	64.0	23.5	30.9	29.4	16.2	66.2	10.3
Both	38.7	27.6	58.0	25.9	35.4	27.2	11.5	65.8	8.2

Key: PD = phonic decoding; PP = phonological processing; WM = working memory.

Table 5 gives the results of an analysis in which numbers of at-risk children showing various cognitive deficits are expressed as percentages of the total sample. It is notable that the percentage of pupils with a working memory deficit is 12%, which is consistent with recent estimates by researchers at Durham University that about 10% of the school population have impairments in working memory (BBC, 2008).

Table 5. Percentages of the total sample showing cognitive deficits

Category	PD deficit	PP deficit	WM deficit	No deficit	1 deficit	2 deficits	3 deficits	PP and/or WM deficit	No PP or WM deficit
Primary	5.8	8.6	12.9	7.4	10.6	6.2	1.4	16.8	1.4
Secondary	9.4	4.1	11.6	4.3	5.6	5.4	2.9	12.0	1.9
Both	8.1	5.8	12.1	5.4	7.4	5.7	2.4	13.7	1.7

Key: PD = phonic decoding; PP = phonological processing; WM = working memory.

Using these data, it is possible to divide the at-risk group into three subgroups based on the degree and type of cognitive impairment, as follows:

Subgroup 1. High risk of dyslexia/SpLD (phonological type)

Poor reading and/or spelling skills (standard score 85 or below) with TWO OR MORE areas of cognitive deficit (i.e. phonic decoding, and or phonological processing, and or working memory). It is likely that most of the pupils in this category would have 'classic' phonological dyslexia to a severe or fairly severe degree.

Subgroup 2. Moderate risk of dyslexia/SpLD (phonological type)

Poor reading and/or spelling skills (standard score 85 or below) with ONE area of cognitive deficit (i.e. phonic decoding or phonological processing or working memory). It is likely that most of the pupils in this category would have less severe dyslexia of the 'classic' phonological type or perhaps of an atypical type.

Subgroup 3. Moderate risk of dyslexia/SpLD (non-phonological type)

Poor reading and/or spelling skills (standard score 85 or below) without deficits in either phonic decoding, phonological processing or working memory, but with other indicators of dyslexia/SpLD, such as persistent difficulties with handwriting or mathematics, coordination problems, or attentional difficulties. It is likely that most of the pupils in this category would have either atypical types of dyslexia not characterised by phonological difficulties, or other forms of SpLD.

It should be noted that these subgroups have been created to enable a better understanding of individual differences in dyslexia/SpLD risk, and also to permit an examination of the impact of specialist teaching on pupils in these different subgroups, when the final data from the intervention study are analysed. It should not be assumed that these subgroups correspond to any particular theoretical 'subtypes' of dyslexia sometimes discussed in the research literature.

Table 6 shows the breakdown of the at risk group into the three subgroups described above. It is notable that subgroup 1 accounts for a relatively greater percentage of the at risk group in Year 7 than it does in Year 3, and correspondingly, subgroup 2 accounts for a relatively greater percentage of the at risk group in Year 3 than it does in Year 7. This reflects the fact that the older the pupils, the more likely it will be that those who are at educational risk will have more severe problems. The reason for this effect is because a relatively greater proportion of pupils with less severe problems will have been taken out of risk as a result of educational input. This, in turn, underlines the importance of identifying children with severe risk as early as possible because, unless given appropriate specialist intervention, they will still be likely to be experiencing major educational difficulties years later.

Discussion of results

The proportion of pupils found to be at risk of dyslexia/SpLD was relatively higher for Year 3 (26%) and somewhat lower for Year 7 (18%). Such age-related changes would be expected as a function of educational input, but nevertheless the results suggest that over four school years from Year 3 to Year 7 less than a third of children who are at risk of educational failure have been lifted out of risk as a result of their schools' approaches to teaching, learning and whatever SEN provision has been made. However, two thirds of the children remain at risk, underlining the need

for increased expertise amongst those working in the schools to identify and address SEN.

Table 6. Breakdown of the at-risk group into subgroups based on number and type of cognitive deficits

Category	As a percentage of the at risk group			As a percentage of the total sample		
	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 1	Subgroup 2	Subgroup 3
Primary	29.9	41.1	29.0	8.0	11.0	7.7
Secondary	45.6	30.9	23.5	8.5	5.7	4.4
Both	38.7	35.4	25.9	8.3	7.6	5.6

Of particular relevance to this study is the proportion of pupils who did not achieve expected levels in SATs that were also judged to be at risk for dyslexia/SpLD, based on the screening results. Just over half (56%) of pupils who did not achieve expected levels in SATs fell into this category. However, because the prevalence of dyslexia/SpLD risk was similar across the three local authorities and the proportion of pupils who did not achieve expected levels in SATs differed across the three authorities, it is inevitably the case that the proportion of pupils who did not achieve expected levels in SATs that were also judged to be at risk for dyslexia/SpLD likewise differs across the three authorities. This proportion is lower in the relatively deprived inner London borough (44%) than it was in the other two authorities (61%). In other words, in more deprived areas a relatively greater proportion of pupils that did not achieve expected levels in SATs will do so for reasons other than dyslexia/SpLD, while in less deprived areas a relatively greater proportion of pupils that did not achieve expected levels in SATs will do so because of dyslexia/SpLD. This is consistent with current international research evidence on the genetic basis of specific reading difficulties (see Nation and Coltheart, 2006).

Of course, not all pupils who have dyslexia/SpLD do not achieve expected levels in SATs. Some pupils with dyslexia/SpLD, especially if they are bright or have had the benefit of a synthetic phonics and/or multisensory teaching programme, will be able to compensate for their difficulties to a sufficient extent that they can reach the expected level. However, the majority of pupils who are at risk of dyslexia/SpLD did not achieve expected levels in SATs. In fact, the data from the screening showed that 80% of the pupils at risk of dyslexia/SpLD in the study did not achieve expected levels in SATs. In the interests of brevity, full analysis of this phenomenon has not been given here. Nevertheless, it is important to note that in areas where there are high levels of deprivation, this figure rises to, or close to, 100%, suggesting that the 'double whammy' of dyslexia/SpLD and socio-economic hardship is a particularly difficult challenge to overcome.

Differences in the proportion of at-risk pupils with more cognitive deficits compared with those who have fewer cognitive deficits demonstrates the importance of identifying children with risk as early as possible because, unless given appropriate specialist intervention as early as possible, they will still be likely to be experiencing major educational difficulties years later and, in all probability, into adulthood.

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'No To Failure' Project Office
British Dyslexia Association
Unit 8, Bracknell Beeches
Old Bracknell Lane
Bracknell, Berkshire, RG12 7BW, UK
Tel +44 (0)1344 381565
www.notofailure.com